Francesco Porro\textsuperscript{1}, Marcella Polisicchio\textsuperscript{2}

A randomized response model via inverse sampling with unequal probabilities

Abstract

When a survey deals with sensitive characteristics such as drug abuse, illegal activities, or embarrassing behaviors, sometimes it is not easy to obtain trustworthy answers. To solve this problem, Warner (1965) was the first to propose a randomized response model which allows to collect data respecting the privacy of the respondents. Starting from that innovative paper, many improvements and evolutions were developed in literature.

Haldane (1945) was the first to describe and analyze a new original method of sampling. In such method, called inverse sampling, the sample size is not decided a priori: the random drawing goes on until a pre-fixed number of elements with the considered characteristic is drawn. After that article, the inverse sampling has been studied and many papers showed that in some situations, it is very feasible and convenient, for example when the proportion of people bearing the considered characteristic is very small.

The aim of the present paper is to describe a new sampling design in which the both two aforementioned techniques are applied, introducing one more feature: the unequal probabilities of selection. For this new method, some estimators and the analysis of their features are provided.

References


\textsuperscript{1}University of Milan-Bicocca, Milan, francesco.porro1@unimib.it

\textsuperscript{2}University of Milan-Bicocca, Italy, marcella.polisicchio@unimib.it